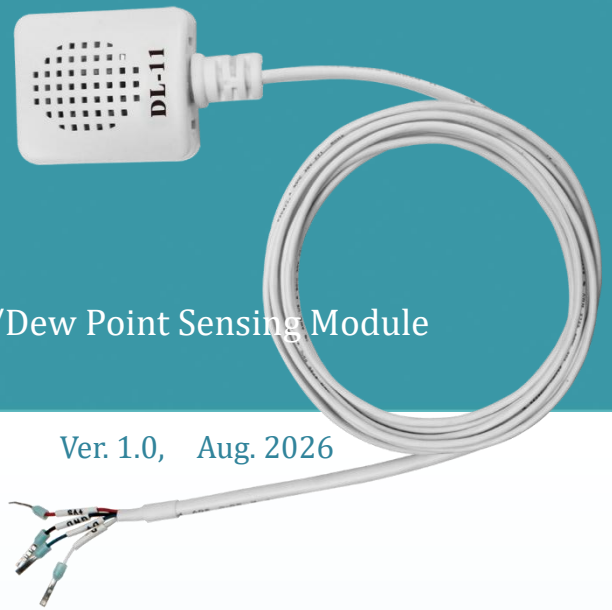


DL-10-UL

Temperature and Humidity Sensing Module

DL-11-UL

Temperature/Humidity/Atmospheric pressure/Dew Point Sensing Module



Ver. 1.0, Aug. 2026

WARRANTY

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

WARNING

ICP DAS assumes no liability for damages consequent to the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, nor for any infringements of patents or other rights of third parties resulting from its use.

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CONTACT US

If you have any questions, please feel free to contact us via email:
service@icpdas.com



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Safety Instructions

This manual uses standard hazard notification statements to alert the user to potential safety risks. Ensure all personnel read and understand these definitions before installation or operation. Keep this manual for future reference.



WARNING

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or equipment damage.



WARNING

- Installation and servicing shall be performed only by qualified service personnel familiar with industrial control equipment and applicable electrical codes.
- Disconnect all power sources before installing, wiring, servicing, or removing the product.
- Do not disassemble, modify, or repair this product. There are no user-serviceable parts inside.
- This product is not waterproof; keep it away from liquids and humid environments.
- Use this product only as described in this manual.



CAUTION



Power Supply

- Use only a power supply that provides **SELV or double insulation** and complies with the **Limited Energy (LE) or Limited Power Source (LPS)** requirements evaluated in accordance with UL 61010-1, UL 61010-2-201, or UL 62368-1.
- The power supply shall comply with the electrical ratings specified for the product.
- Ensure proper grounding before connecting a Class 1 adapter to the product.
- When powered by PoE, do not route the network outdoors.
- Disconnect the power supply before installing, removing, or wiring the product.

**CAUTION****Magnetic Mounting**

This product is equipped with a **Neodymium magnet** (N35/Ni, $\phi 10$ mm $\times$ 3 mm) on the rear panel for magnetic mounting.

Magnetic Mounting Surface Compatibility

Sheet Metal Material	Magnetic Characteristics	N35 Magnet Holding Performance	Suitability
Pure Iron	Extremely strong ferromagnetism	Very strong holding force	Fully Suitable
SPCC/SECC/SGCC/SS400	Strong ferromagnetism (carbon steel)	Strong and stable holding force	Fully Suitable
SUS410/ SUS430	Moderate ferromagnetism (martensitic/ ferritic stainless steel)	Good holding force	Fully Suitable
Cold-Worked SUS304	Weak magnetism induced by cold working	Weak to moderate holding force	Not Suitable
Annealed SUS304/ SUS316	Austenitic (non-magnetic or very weakly magnetic)	No or very weak magnetic attraction	Not Suitable

- Ensure the mounting surface is made of ferromagnetic steel with sufficient thickness (e.g., ≥ 1.5 mm) to achieve maximum holding force.
- Painted, coated, or non-ferromagnetic surfaces will significantly reduce the magnetic holding force.
- Do not install the product in environments subject to continuous high vibration or external mechanical impacts to prevent accidental detachment.

Mounting Recommendation:

Wall mounting is the preferred and recommended method for securely installing the product. Magnetic mounting may be used only on suitable ferromagnetic surfaces that provide sufficient magnetic holding force to prevent the device from becoming detached or falling.



CAUTION



Wiring and Connections

- Turn off the power before making or changing any wiring connections.
- Use only copper conductors rated for 75 °C (167 °F) or higher.
- Use wiring and connection components with ratings suitable for the specified operating conditions.
- Route signal wiring separately from power wiring whenever possible.
- Verify that all terminal screws are securely tightened before applying power.



Installation Environment

Install in a suitable industrial control enclosure that provides protection against:

- Electric shock
- Fire
- Mechanical damage
- Dust and moisture

The enclosure shall be accessible only by the use of a tool.

Provide adequate ventilation around the product. Do not block ventilation openings.



Operating Conditions

- Operate the product only within the environmental specifications in this manual.
- Do not install or operate the product in locations subject to excessive dust, moisture, corrosive or explosive gases, or other environmental conditions that exceed the specified ratings.
- Disconnect the power and network cables during thunderstorms to prevent damage.
- Do not mount the product on surfaces exceeding 70°C
- Pollution Degree 2
- Installation Category (Overvoltage Category) I
- Altitude up to 2000 m (6,561 ft.)
- Indoor use only



CAUTION



Maintenance and Servicing

- Disconnect all power sources before performing maintenance or servicing.
- Clean only with a dry, soft cloth.
- Do not use solvents, aerosol cleaners, or abrasive materials.
- Periodically check wiring and hardware for safe operation.
- Do not attempt to disassemble or repair the product.
- Do not use the product if it is damaged or operates incorrectly.

Contact service centers.



Warranty Limitation

- Damage caused by failure to follow these instructions is not covered by warranty.
- This product is covered by ICP DAS official warranty.

Contact Information

🌐 Website: <https://www.icpdas.com/>

✉ Email: service@icpdas.com

☎ Phone: +886-(03)-597 3366

🏠 Address: No. 111, Guangfu N. Rd., Hukou Township, Hsinchu County 30351, Taiwan, R.O.C.

1. Introduction

The **DL-10-UL / DL-11-UL Series** are standalone remote sensing modules intended for **indoor use** in industrial monitoring and control applications. They are designed to monitor multiple temperature, humidity, pressure, and dew point measurement points over an RS-485 network. Supporting the Modbus RTU protocol, the modules enable seamless integration with industrial control systems and can be configured using DCON Utility Pro. Their compact design minimizes installation space, making them suitable for space-constrained applications.

1.1 Package List

The shipping package includes the following items:



DL-10-UL/
DL-11-UL



Quick Start



NOTE

If any of these items is missing or damaged, please contact your local distributor for more information. Keep the shipping materials and overall package in case you want to ship the module back in the future.

More Information

■ Product Page:

<https://www.icpdas.com/en/product/DL-10>

<https://www.icpdas.com/en/product/DL-11>

Documentation:

<https://www.icpdas.com/en/download/index.php?model=DL-11>

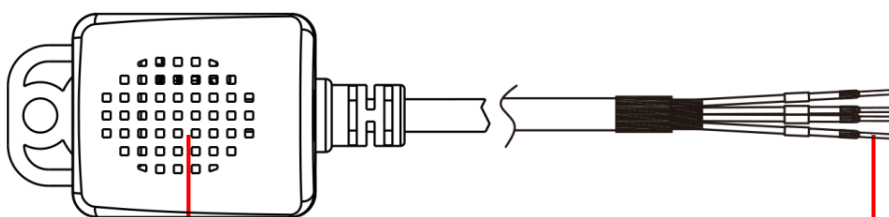
■ Free Development Software – DCON Utility Pro:

https://www.icpdas.com/en/product/guide+Software+Utility_Driver+DCON_Utility_Pro

2. Hardware Information

2.1 Appearance & Pin Assignments

Front Panel



DL-10-UL: Temperature / Humidity Sensor

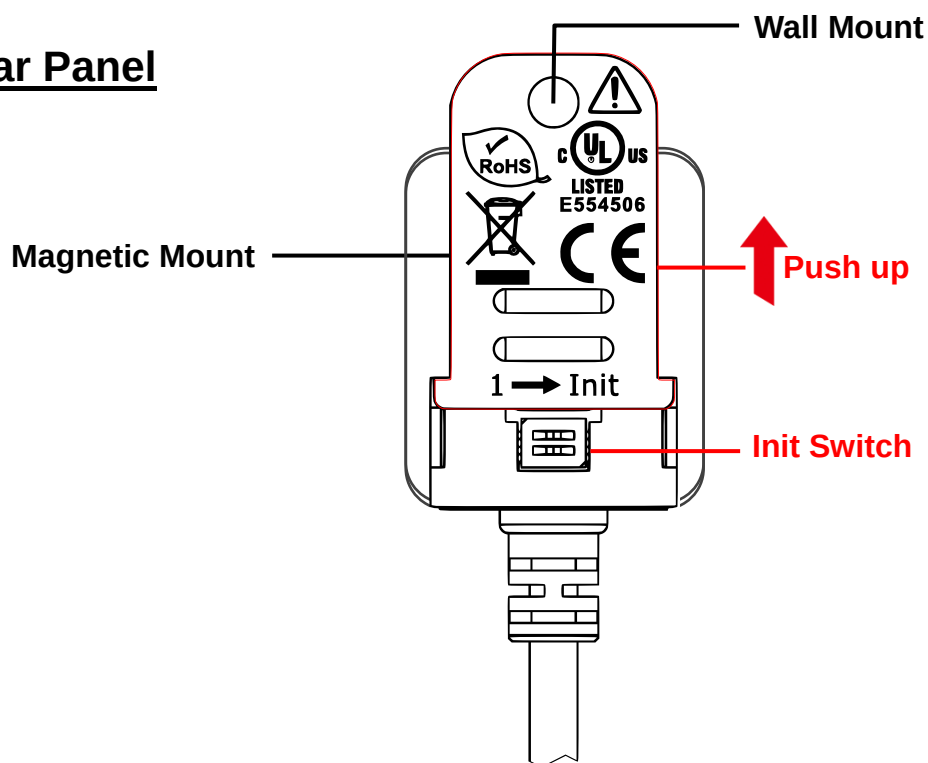
DL-11-UL: Temperature / Humidity

Atmospheric Pressure Sensor

Power and RS-485 Connector

CONN	Color	Pin Assignment
1	White	D-
2	Red	Vcc
3	Black	GND
4	Green	D+

Rear Panel



2.2 Specification

Model	DL-10-UL	DL-10-BK-UL	DL-11-UL	DL-11-BK-UL
Temperature Sensor				
Measuring Range	-25 ~ +70 °C (-13 ~ +158 °F)			
Resolution	0.1 °C			
Accuracy	Typical: ± 0.4 °C @ 0 ~ 60 °C; refer to Figure 2			
Precision	± 0.1 °C			
Humidity Sensor				
Measuring Range	0 ~ 95% RH			
Resolution	0.1% RH			
Accuracy	Typical: ± 3% RH @ 20 ~ 80 % RH; refer to Figure 1			
Precision	± 0.1% RH			

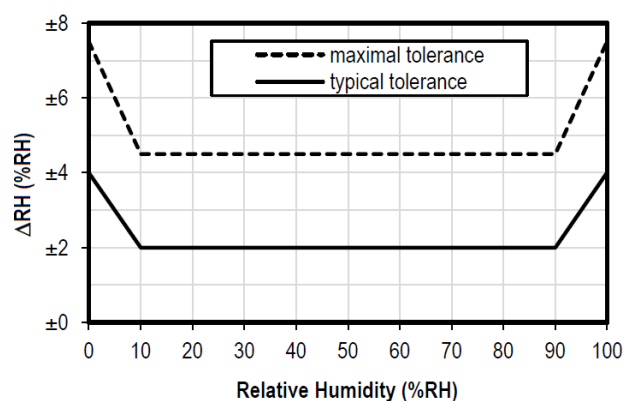


Figure 1 Tolerance of RH at 25°C for sensor.

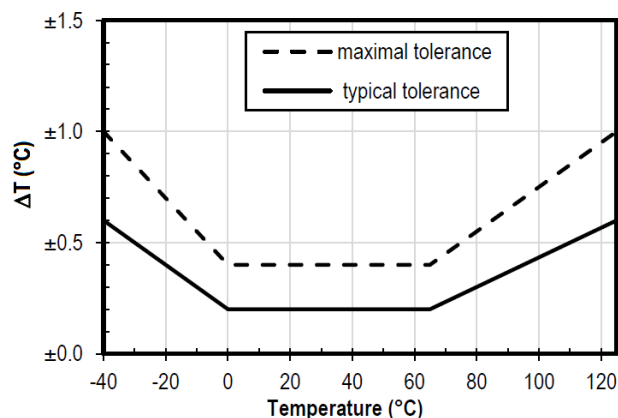


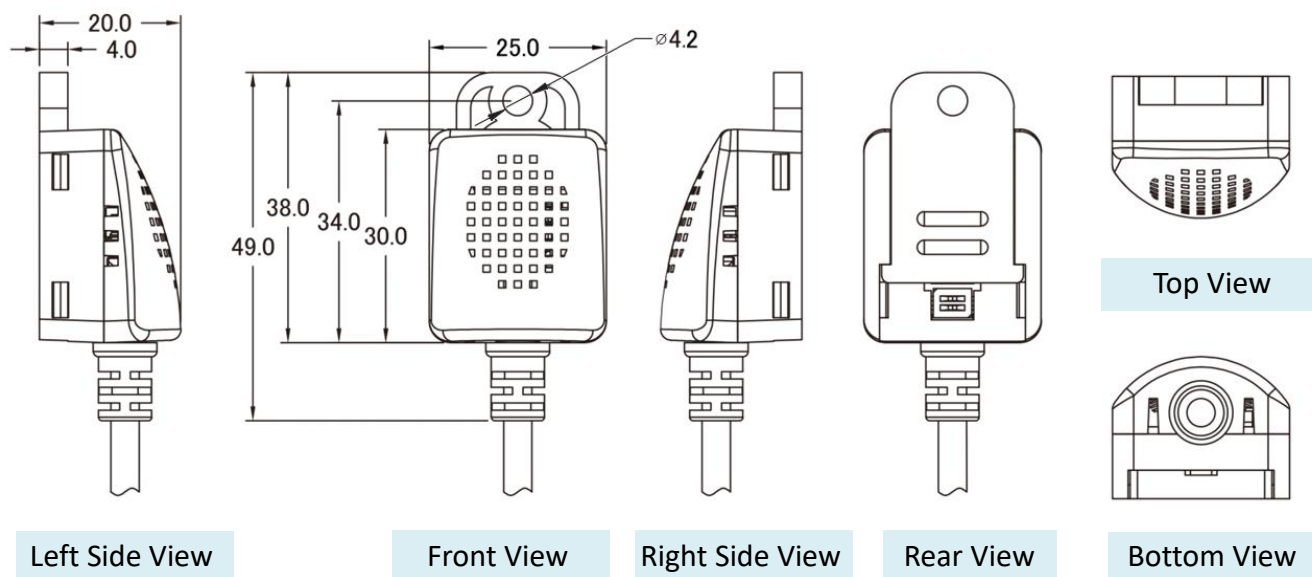
Figure 2 Temperature accuracy of the sensor.

Dew Point		
Range	-	Calculated using temperature and relative humidity
Resolution	-	0.1 °C
Atmospheric Pressure		
Range	-	300 ~ 1200 hPa
Accuracy	-	1 hPa
Resolution	-	0.1 hPa
Communication		
Interface	1 x RS-485; non-isolated	
Baudrate	1200 ~ 115200 bps	
Data Format	N, 8, 1	
Protocol	Modbus RTU	
Max. Modules on same bus	32	

Model	DL-10-UL	DL-10-BK-UL	DL-11-UL	DL-11-BK-UL
Power				
Input Range	+10 ~ +30 V _{DC}			
Consumption	0.05 W			
Requirement	SELV or double-insulated power supply complying with the applicable LE or LPS requirements			
Mechanical				
Dimensions (W x L x H)	25 mm x 20.2 mm x 30 mm			
Weight	51g ± 3 g			
Installation	Magnetic mount; Wall mount			
Cable Length	3 m			
Color	White	Black	White	Black
Environment				
Operating Temperature	-25 ~ +70 °C			
Storage Temperature	-30 ~ +80 °C			
Humidity	0 ~ 95% RH, Non-condensing			
Operating Location	Indoor use only			
Pollution Degree	Pollution Degree 2			
Altitude	Up to 2,000 meters (6,561 ft.)			
Overvoltage Category	Category I (OVC I)			

2.3 Dimensions

Unit: mm



2.4 Factory Default Settings

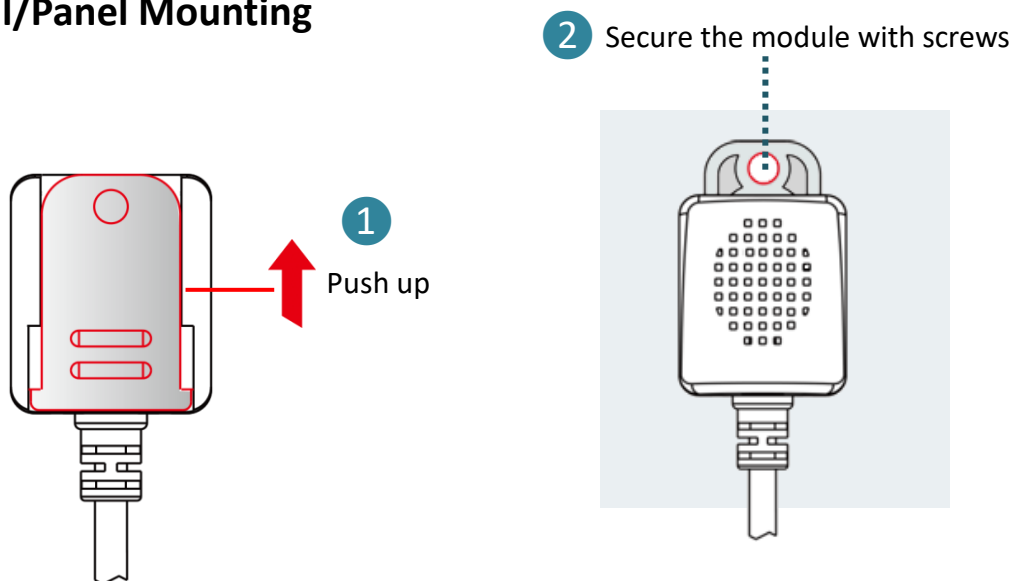
Item	Default	Item	Default
Device ID	1	Data Format	N, 8, 1
Baud Rate	115200 bps		Parity: None
Protocol	Modbus RTU		Data Size: 8
			Stop Bits: 1

2.5 Mounting the DL Module

Wall mounting is the preferred and recommended method for securely installing the DL Module.

Magnetic mounting may be used only on suitable ferromagnetic surfaces that provide sufficient magnetic holding force to prevent the device from becoming detached or falling.

■ Wall/Panel Mounting



When the module is mounted on a wall, ensure that the mounting surface and mounting hardware are suitable for securely supporting the module.

- For concrete or masonry walls, use appropriate anchors and screws suitable for the wall material.
- For wooden walls or other wood-based surfaces, use appropriate screws or mounting hardware suitable for the material and thickness of the mounting surface.

■ Magnetic Mounting

Magnetic backing enables the DL module to be easy mounting on ferromagnetic surfaces.



NOTE

When using magnetic mounting:

- Install the module only on a suitable ferromagnetic surface, such as iron or steel, that provides sufficient magnetic holding force.
- Paint, coatings, plating, plastic film, or other non-magnetic coverings may reduce magnetic holding force. Ensure that the module remains securely attached.- Not subject to vibration or movement
- Do not use magnetic mounting in locations subject to excessive vibration, shock, or impact that may cause the module to detach.

Magnetic Mounting Surface Compatibility

Sheet Metal Material	Magnetic Characteristics	N35 Magnet Holding Performance	Suitability
Pure Iron	Extremely strong ferromagnetism	Very strong holding force	Fully Suitable
SPCC/SECC/SGCC/SS400	Strong ferromagnetism (carbon steel)	Strong and stable holding force	Fully Suitable
SUS410/ SUS430	Moderate ferromagnetism (martensitic/ ferritic stainless steel)	Good holding force	Fully Suitable
Cold-Worked SUS304	Weak magnetism induced by cold working	Weak to moderate holding force	Not Suitable
Annealed SUS304/ SUS316	Austenitic (non-magnetic or very weakly magnetic)	No or very weak magnetic attraction	Not Suitable

3. Getting Started

This chapter provides a basic overview of how to configure and operate your DL module.

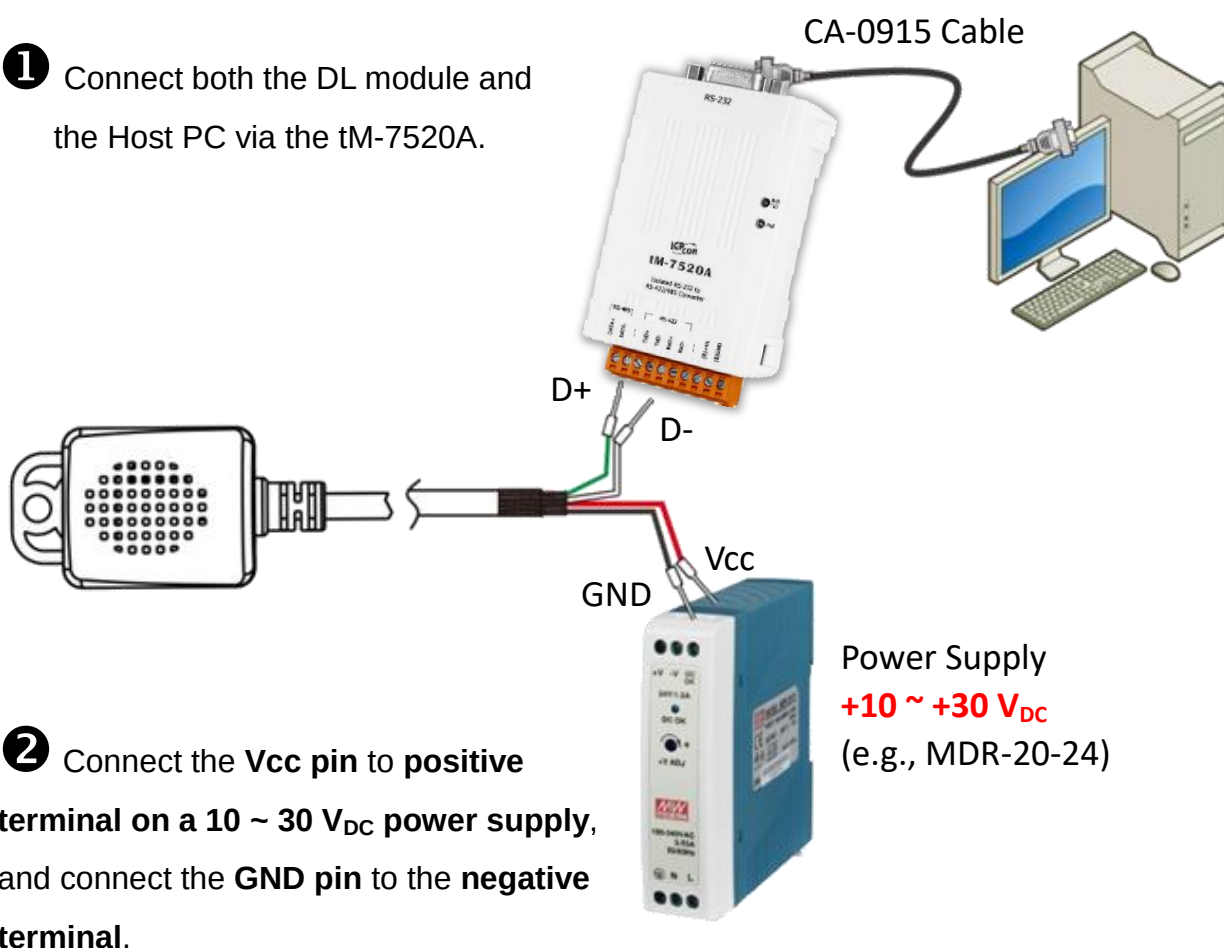
3.1 Connecting the Power and the Host PC

Prepare for device

- ☑ RS-232 to RS-485 Converter: tM-7520A (optional)
- ☑ Exterior power supply device: MDR-20-24 (optional)

Wiring

- 1** Connect both the DL module and the Host PC via the tM-7520A.



- 2** Connect the **Vcc** pin to **positive terminal** on a **10 ~ 30 V_{DC}** power supply, and connect the **GND** pin to the **negative terminal**.

Cable and Wiring Specifications

When connecting the device to the power supply and the tM-7520A RS-485 converter, use the specified cable assembly complying with UL requirements:

Item / Parameter	Specification / Requirement	Details & UL Compliance
Cable Style	UL2725 (1P + 2C Shielded Cable)	UL Listed / Recognized Cable
Wire Gauge	28 AWG	Conductor Size
Conductor Material	Copper (Cu)	Pure Copper Conductor
Temperature Rating	75 °C	Standard Rating for UL2725
Voltage Rating	30 V	Low Voltage DC Operation
Terminal Type	E0308 Cord End Ferrules	Insulated Pin Terminals
Wire Identification	D+, D-, VCC, GND	Color/Shrink Tube Labeled
Cable Length	3000 ± 50 mm	Outer Diameter: 3.0 mm



CAUTION

- Ensure the UL2725 cable (28 AWG, 75 °C rating) with pre-installed **E0308 ferrules** is properly inserted into the terminal blocks of the tM-7520A converter and power module.
- Verify that all pin signals (**D+**, **D-**, **VCC**, **GND**) are correctly matched to the corresponding screw terminals before tightening to prevent damage to the module and system.

3.2 Installing Software on Your PC

Download **DCON Utility Pro.zip** from the ICP DAS web site and decompress it



<https://www.icpdas.com/en/download/show.php?num=1046>

3.3 Searching Module

Step 1

Run the DCON Utility Pro software



DCON_Utility_Pro.exe
DCON_Utility_Pro_PC

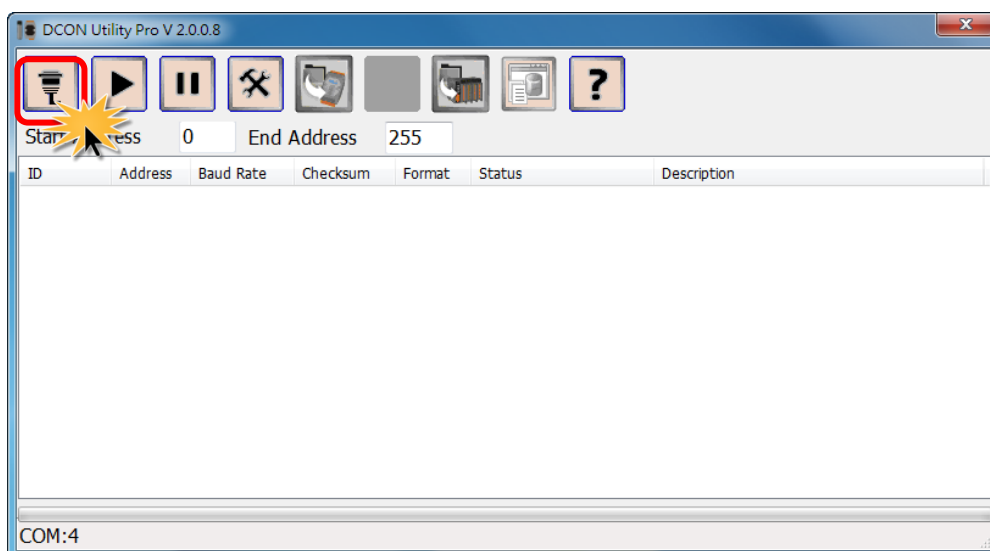
Double click the DCON_Utility_Pro.exe.



Step 2

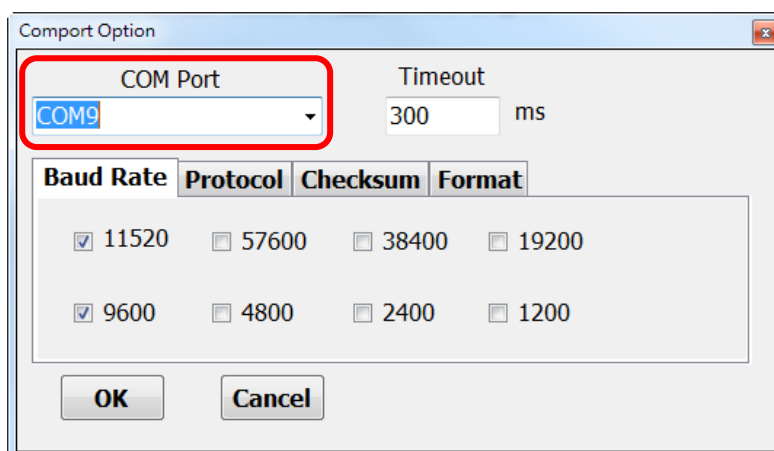


Click the button to open the “**Comport Option**” dialog box.

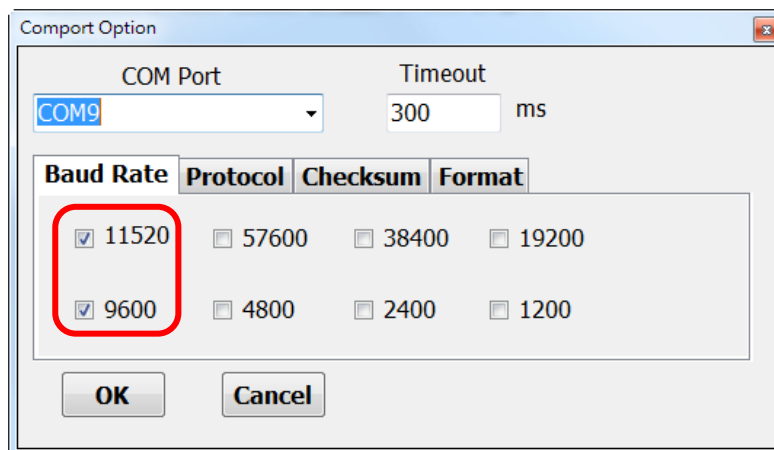


Step 3

Select COM Port (e.g., COM9) on the Host PC to which the DL module is connected.

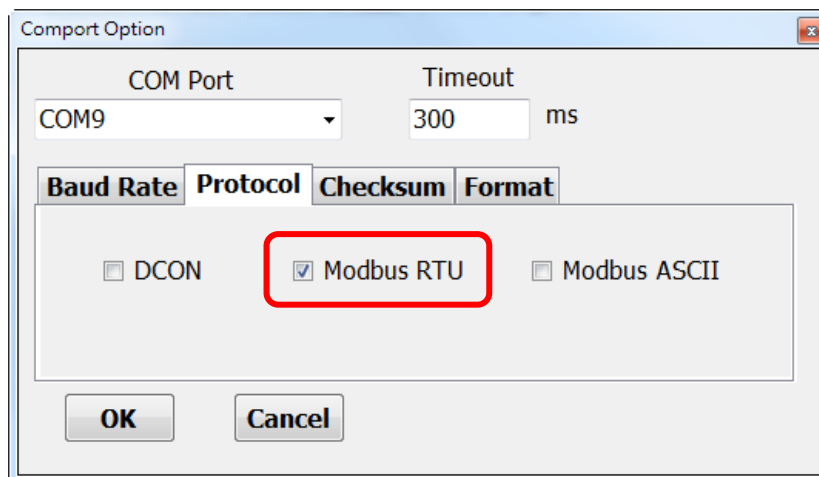
**Step 4**

Select the Baud Rate (e.g., 9600 and 115200) depends on DL module in the Baud Rate page.

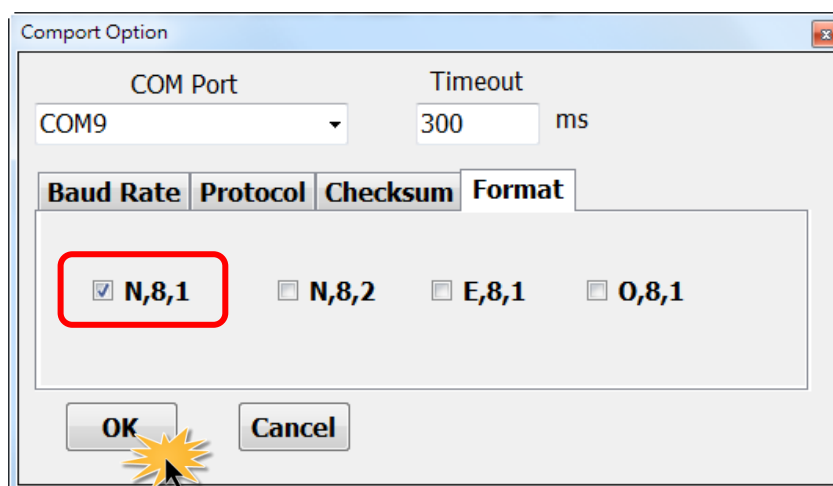


Step 5

Select the protocol that the DL module is using in the Protocol page.

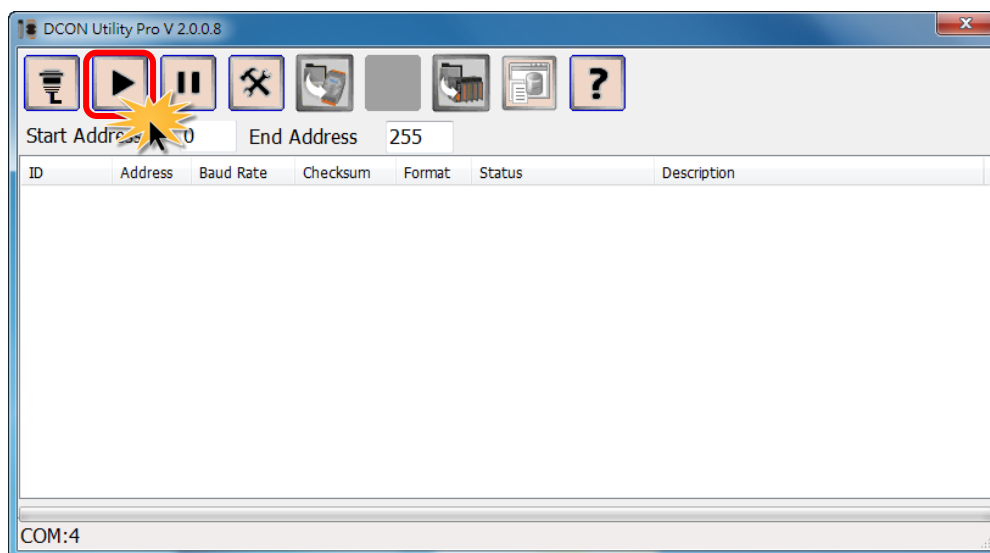
**Step 6**

Select the Data Format that the DL module is using in the Format page and click “OK”.

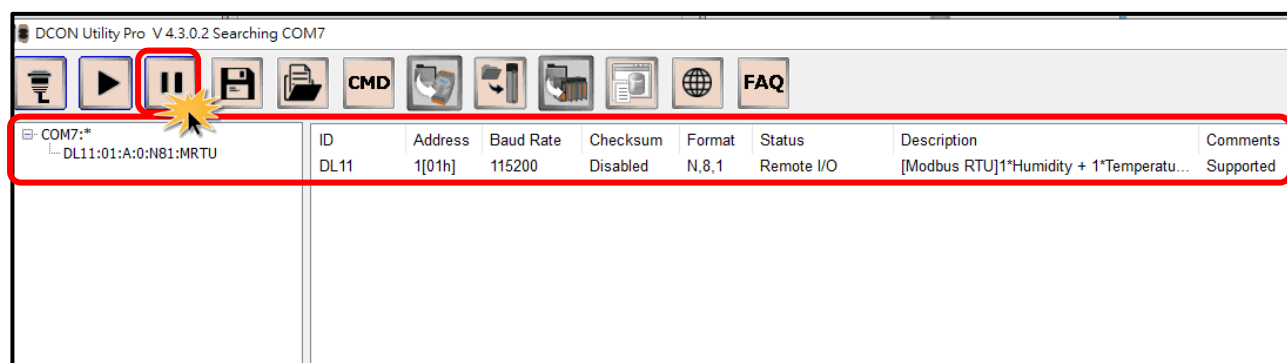


Step 7

Click the  button to search DL module.

**Step 8**

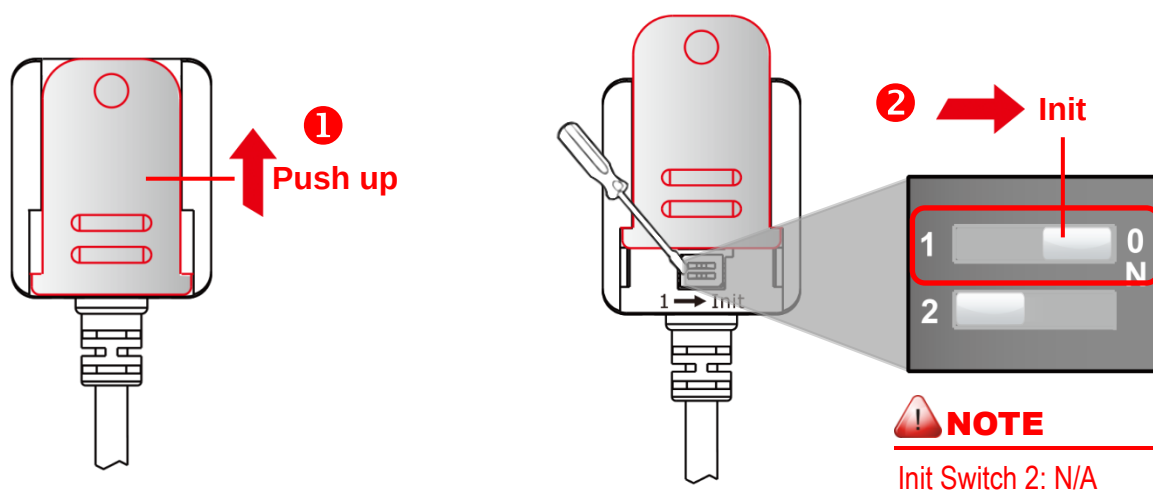
After the DL module name is displayed in search list, click the  button.



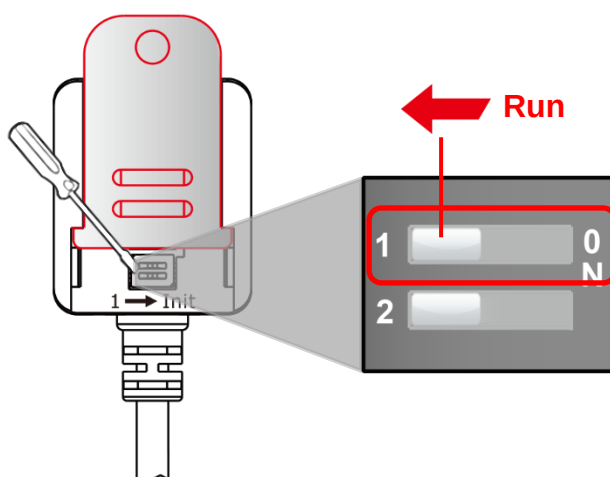
What to do if the DL module is not detected?

Ensure that the power supply and the RS-485 wiring for the DL module are configured correctly, refer to the [Section 3.1 Connecting the Power and the Host PC](#). If the DCON Utility Pro still cannot find the DL module when normal wiring and power up, please follow the procedures described below to solve the situation:

1. Use the blade of a flat-head screwdriver to set the “**Init Switch 1**” on the DL module to the “**ON**” (**Init Mode**) position, and **reboot** the module.

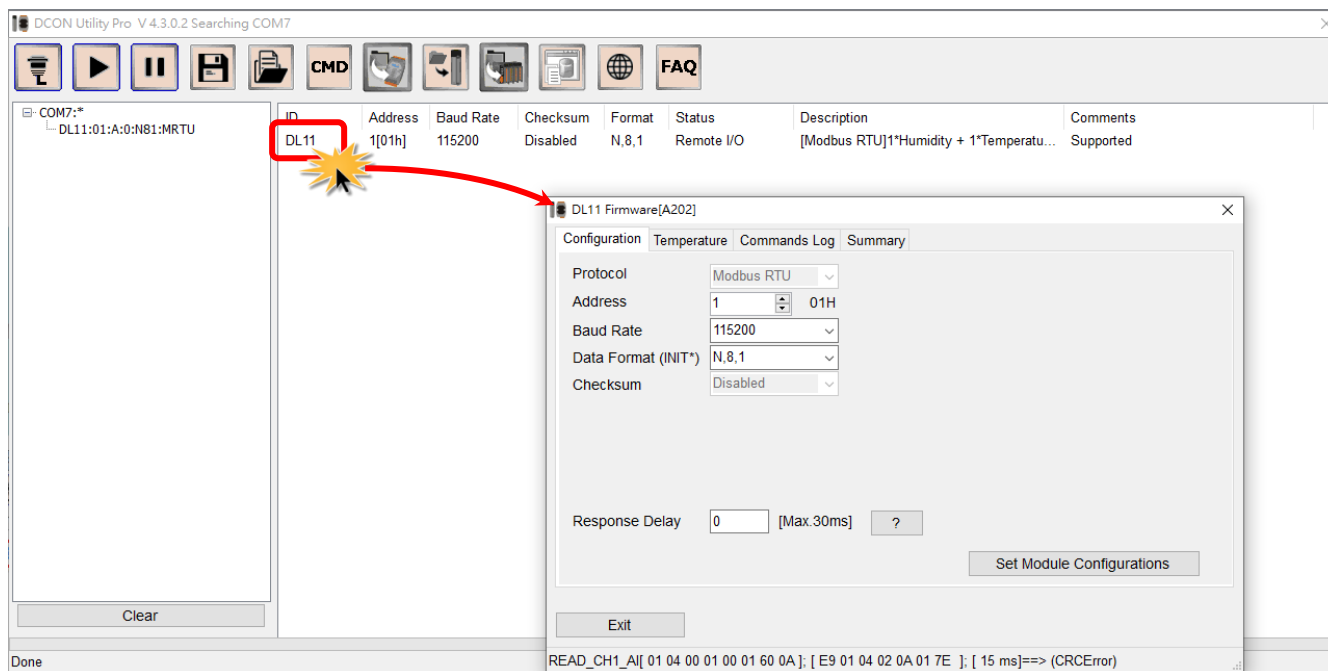


2. In the **Init mode**, refer to **Steps 2 to 8** in “[Section 3.3 Search Module](#)” to execute the search process again.
3. Confirm that the DCON Utility Pro has found the DL module, use the blade of a flat-head screwdriver to set the “**Init Switch 1**” to the “**1**” (**Run Mode**) position, and **repower cycle** the module.



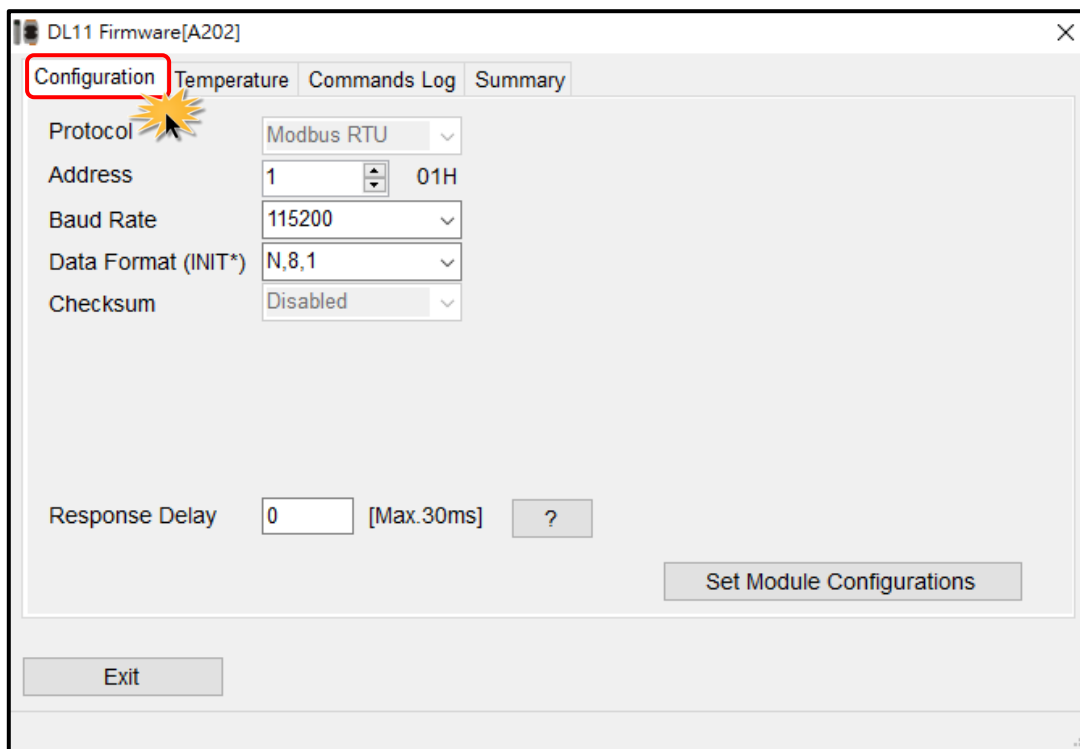
3.4 Configuring Module

In the DCON Utility Pro software, click the module name to open the configuration window, allowing you to configure and verify the readings on the module, each of which will be described in more detail below.



Configuration

You can view and configure the settings of the DL module, including the Address, Baud Rate and Data Format on the “**Configuration**” page.



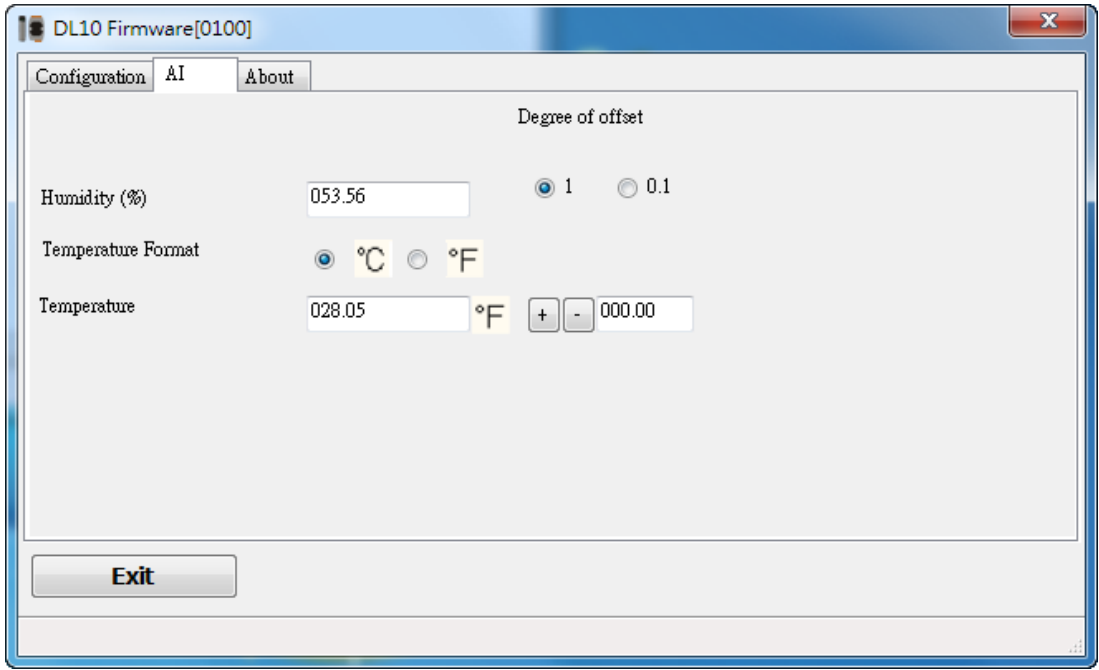
The following is an overview of the parameters:

Item	Description
Address	Sets the device ID for the module.
Baud Rate	Sets the Baud Rate for the module.
Data Format	Reads the Data Format on the module. (N, 8, 1 fixed)
Set Module Configurations	Click this button to save the new settings to the module.

Data Reading

DL-10-UL

Click the “AI” tab to see the measured humidity and temperature values.



The following is an overview of the parameters:

Item	Description
Humidity(%)	Display humidity value
Temperature Format	Set the temperature to Degrees Celsius(°C) or Fahrenheit(°F)
Temperature	Display temperature value
Degree of offset	Set the temperature offset value. If the offset is 1 degree, pressing“+” or “-” button once will increase or decrease set temperature by 1 degree. If the offset is 0.1 degree, pressing“+” or “-” button once will increase or decrease set temperature by 0.1 degree.

DL-11-UL

On the “**Temperature**” page, you can view the measured values and set the offset for each item.

DL11 Firmware[A202]

Configuration **Temperature** Commands Log Summary

Humidity (%) 055.60

Temperature °C 028.46

Temperature °F 083.22

Dew Point °C 018.71

Dew Point °F 065.67

Atmospheric Pressure (hPa) 9972

Altitude (m) 0134.0

Degree of ☒ 1 ☐ 0.1

+ - -002.00

+ - -000.50

+ - 000.00

+ - 000.00

Sea Level Pressure(800~1260 hPa) Set

Save Sea Level Pressure To EEPROM

Exit

READ_CH1_AI[01 04 00 01 00 01 60 0A]; [90 01 04 02 0B 1E 3E]; [15 ms]==> (CRCErr)

The following is an overview of the parameters:

Item	Description
Humidity(%)	Displays humidity value
Temperature	Displays temperature value
Dew Point	Displays dew point temperature value
Atmospheric Pressure	Displays pressure value
Altitude	Displays altitude value calculated from atmospheric pressure
Sea Level Pressure	Enter the sea level pressure value and clicke the “ Save Sea Level Pressure To EEPROM ”to save it if needed.
Degree of offset	Sets the scale of offset to 1 or 0.1 unit of measurement item
Set	Click this button to save new offset settings.

4. Modbus Register Table (Base 0)

4.1 DL-10-UL

■ Discrete Inputs (1xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
10272	0110	1	Read the reset status of a module. 0: The module has not been reset since the last read. 1: The module has been reset, and this is the first time to read the value.	0: Not Reset 1: Resetted	R

■ Input Register (3xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
30000	0000	1	Read the humidity value (unit: 0.01 %)	0 ~ 10000	R
30001	0001	1	Read the temperature value in degrees Celsius (unit: 0.01 °C)	-32768 ~ 32767	R
30002	0002	1	Read the temperature value in degrees Fahrenheit (unit: 0.01 °F)	-32768 ~ 32767	R
30003	0003	1	Read the dew point temperature value in degrees Celsius (unit: 0.01 °C)	-32768 ~ 32767	R
30004	0004	1	Read the dew point temperature value in degrees Fahrenheit (unit: 0.01 °F)	-32768 ~ 32767	R
30480	01E0	1	Read the firmware version (Minor number) Hexadecimal Representation	-	R
30481	01E1	1	Read the firmware version (Major number) Hexadecimal Representation	-	R
30482	01E2	1	Read the module name High byte = 0x00 Low byte = 0x10	0x0010	R
30483	01E3	1	Read the module name High byte = 0x52(ASCII: D) Low byte = 0x48(ASCII: L)	0x444c	R

■ Holding Register (4xxxx)

Register		Points	Description	Data Format	Attribute	Factory Value
DEC	HEX					
40448	01C0	1	Read/Write the temperature offset value (unit: 0.01 °C)	-32768 ~ 32767	R/W	0
40449	01C1	1	Read/Write the humidity offset value (unit: 0.01%)	-32768 ~ 32767	R/W	0
40484	01E4	1	Read/Write the Device ID	1 ~ 247	R/W	1
40485	01E5	1	Read/Write the Baud Rate (bps) and Data Format Bit-5:Bit-0 (Baud Rate) 03: 1200 04: 2400 05: 4800 06: 9600 07: 19200 08: 38400 09: 57600 0A: 115200 Bit-7:Bit-6 (Data Format) 00: no parity, 1 Stop bit 01: no parity, 2 Stop bits 10: even parity, 1 Stop bit 11: odd parity, 1 stop bit	0x03 ~ 0xCA	R/W	0x0A

4.2 DL-11-UL

■ Coils (0xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
00283	011B		Write1 to save sea level pressure to non-volatile memory	1	W

■ Discrete Inputs (1xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
10272	0110	1	Read the reset status of a module. 0: The module has not been reset since the last read. 1: The module has been reset, and this is the first time to read the value.	0: Not Reset 1: Resetted	R

■ Input Register (3xxxx)

Register		Points	Description	Data Format	Attribute
DEC	HEX				
30000	0000	1	Read the humidity value (unit: 0.01 %)	0 ~ 10000	R
30001	0001	1	Read the temperature value in degrees Celsius (unit: 0.01 °C)	-32768 ~ 32767	R
30002	0002	1	Read the temperature value in degrees Fahrenheit (unit: 0.01 °F)	-32768 ~ 32767	R
30003	0003	1	Read the dew point temperature value in degrees Celsius (unit: 0.01 °C)	-32768 ~ 32767	R
30004	0004	1	Read the dew point temperature value in degrees Fahrenheit (unit: 0.01 °F)	-32768 ~ 32767	R
30005	0005	1	Read the air pressure in 0.1 hPa	2600 ~ 12600	R
30006	0006	1	Read the low word of altitude in 0.1 m	-32768 ~ 32767	R

30007	0007	1	Read the high word of altitude in 0.1 m	-32768 ~ 32767	R
30480	01E0	1	Read the firmware version (Minor number) Hexadecimal Representation	0x0000	R
30481	01E1	1	Read the firmware version (Major number) Hexadecimal Representation	0xA202	R
30482	01E2	1	Read the module name High byte = 0x00 Low byte = 0x11	0x0011	R
30483	01E3	1	Read the module name High byte = 0x44(ASCII: D) Low byte = 0x4C(ASCII: L)	0x444c	R

■ Holding Register (4xxxx)

Register		Points	Description	Data Format	Attribute	Factory Value
DEC	HEX					
40448	01C0	1	Read/Write the temperature offset value (unit: 0.01 °C)	-32768 ~ 32767	R/W	0
40449	01C1	1	Read/Write the humidity offset value (unit: 0.01%)	-32768 ~ 32767	R/W	0
40450	01C2	1	Read/Write the pressure offset value (unit:0.1 hPa)	-32768 ~ 32767	R/W	0
40451	01C3	1	Read/Write the altitude offset value (unit:0.1 m)	-32768 ~ 32767	R/W	0
40484	01E4	1	Read/Write the Device ID	1 ~ 247	R/W	01
40485	01E5	1	Read/Write the Baud Rate (bps) and Data Format Bit-5:Bit-0 (Baud Rate) 03: 1200 04: 2400 05: 4800 06: 9600 07: 19200 08: 38400 09: 57600 0A: 115200	0x03 ~ 0xCA	R/W	0x0A

			Bit-7:Bit-6 (Data Format) 00: no parity, 1 Stop bit 01: no parity, 2 Stop bits 10: even parity, 1 Stop bit 11: odd parity, 1 stop bit			
40487	01E7	1	Read/Write the response delay time in ms	0 ~ 30	R/W	0
40498	01F2	1	Read/Write the low word of sea level pressure in 0.01 hPa Default:1013.25 hPa	0x0 ~ 0xFFFF	R/W	0x8BCD
40499	01F3	1	Read/Write the high word of sea level pressure in 0.01 hPa	0x0 ~ 0xFFFF	R/W	0x1

Appendix: Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

Revision	Date	Description
1.0	Aug. 2026	Initial issue